



Job Loss Analysis

ID No: 1322521 **Status:** Closed

Original Date: 01/Dec/2008
Last Review Date: 27/Apr/2009

Organization:

SBU: GLOBAL MANUFACTURING
BU: ALL
Work Type: Technical (Process Engineering)
Title (Work Activity): Trayed Column Inspection
Site/Region:

Personal Protective Equipment (PPE)	Selected	Comments
Safety Shoes	Y	
Hard Hat	Y	
Safety Glasses	Y	
Fire Resistant Clothing	Y	
Hearing Protection	Y	
Lifeline/Body Harness	Y	
Gloves	Y	
Knee Pads	Y	
Personal Gas Monitor	Y	H2S Monitor
Additional Task Specific PPE		
Other	Y	

Reviewers

Reviewers Name	Position	Date Approved
Ready, Ken S (KRDK)	Manager	19/Dec/2008

Development Team

Development Team Member Name	Primary Contact	Position
Mansingh, James (JMZM)	Y	Engineer
Grubb, Rick K. (GRUB)	N	Lead
Moore, Brad (BMJW)	N	Lead
Mullek, Greg A. (GMUL)	N	Lead
Porritt, Thomas M. (TPCS)	N	Lead

Job Steps

No	Job Steps	Potential Hazard	Critical Actions
1	Entering Column for Inspection.	1. Fatality or injury. 2. Loss of time.	1. Reference JLA Control#1101716 (Confined Space Entry). 2. Reference JLA Control#1101716 (Confined Space Entry).
2	Ensure proper PE Inspection Tool Kit.	1. Loss of time if improper tools are not available while performing inspection in column.	1a. Applicable drawings/inspection sheets. 1b. Bubble level, ruler, flashlight (headlamp, bring a backup light), pen and paper (column inspection form, preferable), steel rod/hammer, inspection mirror, digital camera (permit may be required, not intrinsically safe check LEL level), low CI paint marker, laser level/water balance, tool bag, 4oz sample bottle with cap, knee and/or elbow pads.
3	Safety in Column.	1. Personnel injury from contact with column internals and/or loose debris.	1a. Check tray stability before entering tray. *Beware of corroded internals. Do not assume the tray can hold weight. * Column internals are not designed to move, care should be exercised when moving around column internals. 1b. Look for sharp objects. 1c. When water testing, use caution, potential wet/slippery conditions. 1d. Use caution when climbing a Jacob's ladder. Side climbing is easier, while maintaining 3 points of contact. 1e. Scan column area before moving around. Look for probing TI's, slip hazards, low hanging beams, gaps in flooring, etc.

4	Personnel Preparation.	1. Personal injury, not physically conditioned for task, fatigue, heat stress.	<p>1a. Do not perform inspection if one is experiencing muscular/skeletal strains or sprains that might impede climbing ability.</p> <p>1b. Pace yourself, you do not have to complete the column by yourself. Utilize outside resources as appropriate to share the work load. Encourage/schedule breaks.</p> <p>1c. Hydrate the body well before entering the column. Recommended hydrating 3 days before a known column inspection.</p>
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5	Trayed Column Inspection.	<p>1. Economic loss (premature S/D, decrease performance, etc) if discovery item was not noted during S/D.</p>	<p>1a. General Condition: Verify column clean and free of construction debris, hard hats, plywood, rust and other corrosion products. Fasteners tight, internals in place? *Sizing to be consistent with design drawings.</p> <p>1b. Vapor Outlet: Right diameter? Correct clearance from top tray? Weep hole required?</p> <p>1c. Reflux Distributor: Right diameter, location, weep hole in pipe? Flanges tight, piping secure? Provision for expansion? Inlet weir, dimensioned properly? Bubbling action interference due to clearance between pipe and tray deck.</p> <p>1d. Trays: Downcomer clearance okay, within specs? Verify with local SME. Debris in downcomer? Ensure perforations/valves/bubble caps are restricted to the active area as designated by tray design. Right size, pitch, punched entry faces down, material of tray deck OK? Tray level +/-0.125" or per SME? No gaps between tray panels. Panels bolted to each other and support ring? Valve</p> <p>Trays - Count, material, type and weight correct? Bubble Cap Trays – Cap count, height setting and tightness correct? Outlet Weir – Right length, height, level with in +/-0.125" or per SME (downcomer seal)? Weir to shell clearance should be</p> <p>1e. Draw-off Tray: Tray tested for leaks? Seal welded if called for by drawing? Does draw-off pipe drain the tray or the draw-off box? Vortex breaker in the draw-off nozzle? Dimensions of tray chimneys correct, hats secure? Dimensions of draw-off box correct (make sure it does not encroach on the active area of the tray below)? Downcomers provided with seal pans? Weep holes are required for seal pans, do they exist?</p>
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6	Trayed Column Inspection (Con't).	<p>1. Economic loss (premature S/D, decrease performance, etc) if discovery item was not noted during S/D.</p>	<p>1f. x pass to y pass: Many arrangements possible figure out flow pattern and inspect accordingly. Example: single pass to double pass.</p> <p>1g. Demister: Secure in place without gaps? Proper material for service?</p> <p>1h. Feed Inlet: Feed distributed over tray width without splashing or surging upsetting smooth tray action? Room for partially vaporized feed to separate? Inlet pipe interfere with bubbling action or vapor flow on the feed tray? Pipe flanges tight, securely supported with provision for expansion (slotted bolt holes)? Pipes carrying a flashing feed need to be well supported.</p> <p>1i. Vapor, Stripping Steam, Reboiler Return: Inlets above high liquid level and arranged for vapor distribution? *Inlets should not be located too close to trays above or downcomers, seal pans, vapor chimneys and the like. *Mixed-phase returns should be arranged so they impinge on the column wall allowing liquid and vapor separation, extra column height may be needed for this.</p> <p>1j. Water (Oil) Draw-offs: Different designs are possible, inspect based on intended design.</p> <p>1k. Reboiler Feed: Feed nozzle the right size? Stable level provided for thermosiphon reboilers (example - overflow weirs)? For forced circulation reboilers, are level connections in the right place?</p> <p>1l. Bottoms Outlet: Right diameter? Vortex breaker needed? Is it secure? Strainer required and provided? Level connections at the correct level?</p>
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